with honestly.

REP. DELGOBBO: Thank you. So I think that that might be and, you know, Representative Williams had mentioned it, there might be some discussions that we could have with the DPUC whether it may be opening a docket on its own volition might help all of us understand and make it more workable.

So that might be something to consider as this discussion is brought up. Thank you, Madam Chair, for the second time.

REP. NARDELLO: Thank you, Representative DelGobbo. I had to give you a hard time. Come on. Okay. If there are no other questions for Gary then thank you very much.

GARY HALE: Thank you very much.

REP. NARDELLO: And we have computed the speakers on this particular bill. We are going to move onto the next bill, which is House Bill 5724.

And we have two speakers who will be coming together, Roger Anderson and Sally Odland please.

ROGER ANDERSON: I'll speak first, Madam Chairman. I'm Doctor Roger Anderson from Columbia University in New York. I'm an authority senior scholar there at the Lemont [inaudible] Earth Observatory and the Center for Computational Learning Systems at Columbia.

I'm here to speak about House Bill 5724, AN ACT CONCERNING ENERGY SCARCITY AND SECURITY. And, specifically, I'd like to share a couple of experiences that we've had at Columbia working with New York and with Con Emerson on these similar kinds of problems.

This taskforce to study energy scarcity and sustainability is an important mission. Scenario planning is critical for understanding what your future options are.

And sitting through this morning, I would emphasize that it goes beyond the state and down to the city in municipality level. Specifically, for scarcity, you should know what your sources are of oil, gasoline, natural gas, heating oil, and other feed stocks for electricity that you use everyday.

You should know whether it's Saudi Arabian or that it comes from the Gulf of Mexico whether it comes from Canada. How

much of it comes from where?

How much the wholesale prices of it are? And how much they're likely to be into the future? Energy is going to become the single major enabler of a cleaner environment, a better environment for educating young school kids, like we saw earlier this morning.

And the price is going to do nothing but go up. Scenarios need to be looked at in terms of a system model, what we call a system model, for where the fluids and gases begin.

How they're transported to you. Where they're converted into refined products, how those refined products are delivered to your city, state, municipality.

And then how you use them and what happens to the environment after they've been used. Is that my two minutes?

REP. NARDELLO: You can sum up, but then they'll be questions for you.

ROGER ANDERSON: I just want to remind you the price of oil today is $103.90. The price of gas is $9.50. The price of heating oil, wholesale, is $2.70. And these are substantial parts of people's budgets.

REP. NARDELLO: Sally.

SALLY ODLAND: I'm Sally Odland. I'm an administrator at Columbia University where I work with Roger Anderson. But I'm speaking in my volunteer capacity as a board member for the association for the study of peak oil.

And I had the opportunity back on November 1st to give a presentation on risk management for oil supply uncertainty. Here to hear in the State Legislature.

And I wanted to remind everybody that oil had just crossed the $90 threshold on November 1st when I spoke. Today it's at $103. So we're at more than 10% increase.

Natural gas has gone from $6 to $9 in that period. So speaking for [inaudible] we heartedly support the introduction for an energy security bill such as this one, and commend you for raising it at the state level.

Connecticut is a bell weather state in this respect. There

are very few other states that are initiating statewide initiatives. Virginia is in the process.

Massachusetts is following Connecticut's lead and has a hearing next month. And Minnesota has started as well. I think sensitivity analysis is critical.

Playing paper games where you're not actually spending the money, but you're looking at different scenarios for high price, moderate price, and low price and for possible supply disruptions is a critical exercise before you start investing big dollars and making policy changes.

I would suggest for the low price that we consider oil to be $80 to $85 a barrel, which is the new epic floor. And for the high price that you consider, possibly, up around $200.

I've learned, recently, the Navy is using $225 barrel oil to make go, no go, decisions on some designs on some of their major decisions.

ROGER ANDERSON: That's the US Navy.

SALLY ODLAND: That's the US Navy. So we heartedly endorse this effort and would like to aide in any way we can, even if it's providing information on where you might be able to find energy analysts, support documentation.

We've been briefing the presidential candidate campaign staff. We briefed the Pentagon last week. People are taking this very, very, seriously. And I commend you for doing the same.

REP. NARDELLO: Well, in my discretion in Chair and the fact that I presume you come from New York, am I correct?

SALLY ODLAND: Yes, we do. New York.

REP. NARDELLO: Okay. I will ask the question, which will open-ended Mr. Anderson if you have other things that you felt you needed to say today that we didn't allow you to do within the two minutes.

I want to give you that opportunity with all the travel time that you've come and we appreciate you being here.

ROGER ANDERSON: Well, thank you very much. I just actually wanted to hammer home the point about this source question.

Geopolitically it's quite important these days.

Most of your gasoline probably comes from Saudi Arabia and the Middle East manufactured it through refineries and in New Jersey. But you get substantial contributions, particularly, of gas from Canada.

And you've probably heard the flack over NAFTA and whether or not Canada is going to threaten to sell their gas to China, and their oil to China, instead of to the US or in addition to the US.

Mexico, as Sally will tell you, is running out of oil at a substantial rate. Venezuela, I assume that city service Citgo is a major marketer here in the US and in Connecticut, as it is in New York also Luke Oil, which is a Russian oil company.

You really need to start worrying about where your sources are and what options you might have as different scenario plans play out in the real world in the near future.

REP. NARDELLO: Thank you. And I just wanted to say that, the fact of the matter is, we need to make informed decisions so your ability to provide us with this information is crucial.

But I also want to say that it seems that this is something that should be ongoing as opposed to just a taskforce, because I think one thing I've learned being on this Committee is that energy issues change rapidly.

From year to year there are many impacts that we may not have even considered three or four or even one or two years before. So that is something to think about, as well.

ROGER ANDERSON: Just to comment quickly. We're trying to build an integrated system model for New York City in which we have a computer that's running the scenarios all day, every day, and they change as the price is now and as the future pass.

I believe you can set up such a model so that you understand the dynamics of what's happening to you.

REP. NARDELLO: Questions from the Committee? Representative DelGobbo, and then Representative Caron.

REP. DELGOBBO: Thank you, and thank you both for coming up

here today. And I think right from the start I thought this bill had a great deal of merit for the limited meager amount of money that we'd need to undertake such an endeavor.

I guess, the only additional question I'd ask you is it strikes me much like on the electricity issue that we dealt with, there was always sort of this underlining feeling that you're going to turn on this switch, the lights are always going to be on, and the price is going to be a lot less than it is now.

And yet all throughout the public policy discussion in the Legislature and public branch in Connecticut and probably across the country, there were a lot of inconsistent policies to keep that reality true.

We want to keep reliable power, but we do x, y, and z that doesn't connect to that objection. And it seems very much the same in what you're talking about if we all read in the news about where oil prices are going and geopolitical instability and resource scarcity in terms of just profaning capacity and you go on and on and on.

But somehow we don't connect the dots in our own head and, you know, that this is a house of cards that could under any number of scenarios quickly fall down.

So I guess without you, I want to give you the opportunity without being extrapolating too much into the theoretical world. Give us a picture.

Here we are Connecticut and you just mentioned a couple possibilities, Luke Oil and City Citgo. I was thinking CitiBank. Give us a scenario of how in Connecticut just by your impression that there are a lot of vulnerable choke points where any one of them could be an issue for us.

Not just our public service capacity of the agencies that support different functions of Government here. Is there anything you could just offer us to sort of connect this theory to the reality that we are responsible to?

SALLY ODLAND: Well, I'm going to refer this to Roger Anderson, but I'm giving him the topic. The oil, gas, and coal feed stocks to your power supply are critical, because electricity drives the rest of the system.

And I think Connecticut is especially vulnerable to natural

gas disruptions, because of their source from Canada.

ROGER ANDERSON: You know, it's a real interesting point to broaden your look beyond oil, gas, heating oil to also the feed stocks that go into your electricity supply.

At Columbia, we like to talk about the coming electricity economy. Most of the changes we believe that will happen over the next 20-years in transportation, for instance, are going to be electrical.

Cars will run on electricity. Then they'll plug into the electric grid when you to work and that will add additional supply requirements on to the peak load that this lovely book was just looking at for Connecticut.

Natural gas is a, particularly, good source of clean and environmentally friendly energy. It's equivalent in heat in terms of the BTUs. The amount of heat that it gives off is about 1/7 that of oil.

So at $9.50 that would at equivalent price of about $63, $64, or $65 a barrel. So where's the extra $40 coming from. A couple of very important prices that you in Connecticut need to worry about, one is the strength of the dollar itself.

It's hurting the price of oil, in particular heating oil, because it's a 50% surcharge on the commodity that you buy from the Middle East.

Canada is actually a sole link to our current economy, that their price of their dollar and our dollar is, currently, not much different. So they're in the same shape that we are.

If China comes in and offers them $1.50 for a $1 worth of goods, they'll take China every time over the Northeast. It's very important to understand the sources of not just the commodities themselves, but the sources of the forces and processes affecting those commodities. I hope I was specific enough.

REP. DELGOBBO: No, it does. It's sort of like you watch a million war movies and you almost become desensitized of what you see. It doesn't seem real.

And we see this stuff and hear this stuff up here and in the news all the time. And sometimes forget how real it

could be tomorrow.

ROGER ANDERSON: We're very, very consider it real in New York City. I'll tell you that. We're actually more vulnerable than you are.

REP. DELGOBBO: Thank you.

REP. NARDELLO: Representative Caron.

REP. CARON: Thank you, Madam Chairman. As I was reading the bill I noticed how it enunciated how we were going to pick the taskforce. And, essentially, it's just literally a number of appointments by the leadership of the Legislature with no qualifications whatsoever.

So I guess the question would be do you think we should in the final bill put some kind of qualifications, for instance, in an economist with applied knowledge in how markets actually work.

Someone who has worked in the oil or the energy markets in terms of research development exploration. Somebody who is familiar with analysis of the various statistical models that are out there, because one of the appointments can be a Legislator or Legislators.

They could all be Legislators I think as I read the bill. So how much expertise should we have on this taskforce?

SALLY ODLAND: Well I think it's going to be important to have an energy analyst of some sort who's conversant in all the different energy units of majorette, because between BTUs, barrels of oil, gallons, cubic feet of gas, you've got to have somebody that can convert all of those to similar amounts of energy to actually make sense of the arguments and major of the flows.

So if that capacity isn't present already on the staff, I would consider hiring somebody as a consultant to help in that evaluation.

REP. CARON: Okay. Yeah, I mean, I'm just at the point of the [inaudible] it reached its highest level against the dollar. In Middle Eastern countries are thinking of converting the dollars--

SALLY ODLAND: Their switching to a basket of currencies. The different oil [inaudible] are no longer, necessarily,

dollar denominated.

ROGER ANDERSON: If you would, I'd also add that I think you should have somebody worrying about security.

REP. CARON: That crossed my mind. Should we have some kind of a defense analyst as well in terms, as Representative DelGobbo mentioned, do they have a geopolitical world view.

I mean, just off of the top of my head I can think serious problems in Pakistan, Chesnia, [inaudible], obviously, the Middle East. What's going on in Gaza, Venezuela, putting [inaudible] on the board of Columbia?

I mean it just goes on and on. And in that kind of context, I mean, does it make sense for us, maybe not as a state, but to some extent as a nation to consider, considering there are major exporters or importers to the US for energy.

Is Canada, Saudi Arabia I think it's Iran, Mexico, and Venezuela. So, I mean, a lot of our supply is currently and, of course, US production as well.

The majority of our production seems to come from the Western hemisphere. Is that something we should be considering making sure we maybe reduce the imports?

Or is it such a mixed bag in terms of you just pour oil, it goes into a big pot, and then you just send it out accordingly. Could we really structure our market so we, literally, just take supplies from the Western hemisphere for instance?

ROGER ANDERSON: Well, we talk about an electricity economy for one fundamental reason and that is you can make it from a lot of different sources.

Electrons just carry the energy to you. And so, as you convert from automobiles, for instance, that burn gasoline to automobiles that use electrons, you open the source of those electrons to many different feed stocks.

And that gives you, in the scenario game that plays for what we call real options. It gives you real options into the future for protecting yourself against threat.

REP. CARON: Right. And, of course, it's also expanded because of all the new producers and in the free market, so

globally speaking. And the one final thing that I wanted to say is I don't buy Citgo gas at all. It isn't like Venezuela so the heck with them. I won't buy them.

REP. NARDELLO: Thank you, Representative Caron. You do raise some good points. Questions from Members of the Committee? Representative Backer.

REP. BACKER: Thank you, Madam Chair. I think that when we start talking about oil and gas supply it kind of becomes a little difficult for people. I mean, we've always had it.

And we've always had more. And it's traditionally, it's always had its peaks and valleys, but overall it's gotten cheaper. And I would like, I'm going to say the words that shall not be said, the peak oil concerns.

The reasons why people don't like to say it is because there's no set definition for it in a lot peoples' mind. You'll have the detractors that will say well there's more oil in the earth then we'll ever get out.

And so, there's plenty of oil. Of course, we know economically and other ways that's a different story. So warn us if you could for people of the Committee who haven't heard it before, kind of define the issue of peak oil.

And then I wanted to address the Western hemisphere production that Representative Caron talked about in particular, Cantrell, Mexico, places where we're currently getting our oil and the problems that may come from that.

So you guys can trade off or how ever you want to deal with it. Sally you're a control and geologist so maybe you can help us with that.

SALLY ODLAND: Roger was too. He's got a lot of experience in the Gulf of Mexico. Peak oil is just a buzz word, if you will, for that point in time when you reach the maximum producible rate of oil delivery to the system, to the veins of the economy, if you will.

A lot of times in the press now, it's associated with being a doomer or with thinking that there's an immediate steep define to oil. That's not, necessarily, true.

Peak oil people don't, necessarily, think we've peaked already. There's a lot of uncertainty as to whether we can

grow supply in the next ten, fifteen years.

We know, because it takes six to ten years to bring a new discovery online. We know what's in the pipeline as far as new discoveries. And people are mapping out very carefully the incremental barrels a day that they think will come on in the next seven years.

In a best case scenario, we can grow supply over that time. But if there are delays in bringing some of these new fields on due to hurricanes or geopolitics or economics then we're going to have trouble off setting the existing rate of decline in the existing fields.

And so, peak oil is a risk management problem. It's really looking at supply uncertainty being available to keep the same rate of oil delivery to your economy.

And rather then being a world problem, it's actually a country by country problem. Its peak imports that's important, because if you don't have your own oil, which we do, but if you're heavily depended on imports then the only thing that really matters to your country is your access to that oil.

Our oil is coming, for the most part, from Canada, where we get about 2.5 million barrels a day, from Mexico, where we used to get more but we're not getting, again, about 2.5 barrels a day, from Venezuela, who's having trouble keeping up production, from the West coast of Africa, we're getting maybe 1.5 million barrels a day, and from Saudi Arabia.

We get it from other countries too, but that's the bulk of our imports. What we're seeing in our neighboring source countries right now, is that they are having difficulties maintaining their current rates of production and that they are having serious social and geopolitical within their countries in keeping their own populations supplied.

They give them heavily subsidized oil and their own production is falling. Now they have to decide are they going to keep the oil internally for their own populations or are they going to keep it free for export.

So withholding scenarios from exporter countries mean that the import rates to the US could and likely will fall. And this is the concern that we're worried about and that we're trying to encourage people to implement energy efficiencies as rapidly as possible to create a buffer, to create some

spare capacity for this.

ROGER ANDERSON: I would just add that I was very impressed with the ending charge that you gave this Committee, that this taskforce that you're going to set up to evaluate its impact on the economy, which is obvious, but also on food supply.

We're seeing a major push now to take corn and other edible food stocks and turn them into gasoline, essentially, putting pressure on the prices of even wheat, which we use for beer so we have to be careful with wheat.

We see the same thing with transportation where we're balancing electrical sources like subways, trains, metro north, with gasoline diesel, train systems in general.

You can't fly a plane on anything but jet fuel. So that's why we're seeing the Pentagon really seriously worrying about this issue.

REP. BACKER: I think that my question had a piece in it that I wanted to help the Committee and others, kind of, get a grasp. The crude production in the world has remained, relatively, flat for a number of years.

It seems like we're making up fuel through by converting liquids. And I would like that if you could both discuss that a little bit. You're probably better at it then me.

And then look at more of our local supply. I mean, Mexico eminent demise is, in terms of production, is really frightening me, because I think it's about 11% of our oil.

And you may recall I was pumping gas during the oil shortage and I think the shortage was 2% or 3% or 4% of the supply. And we're talking about, possibly, losing 11% in almost one foul swoop over a period of four of five years.

So if you could expand on that. If I'm right tell me. If I'm wrong say you got it wrong.

SALLY ODLAND: As far as Mexico and Chanterelle, yes. I think you're right. The Chanterelle field is declining at somewhere between 15% and 20% a year. And the Premix, the Mexican oil company, provides 40% of the Mexican Government's revenues.

So this is a major blow to everybody. It only takes about a

5% reduction in your supply to start causing severe economic consequences. I don't know what to tell you. You're right.

REP. BACKER: Yeah, I mean, you almost feel like Cassandra around here. The Mexican Government is informed, the security exchange commission, that they're in terminal decline and they may not be able to export after 2012.

And it's 11% of our oil supply and no one around here seems to get excited about it. That excites me quite a bit, because I'll tell you're not going to heat school buildings and all the issues that come with it.

I propose some spending on some bills to move this forward and people say where's the money going to come from. We're not going to take it from anything else.

They don't, yet, view the structures in oil to our society is real. And, you know, you feel like Cassandra here talking to people that Canada has already said they're going to cut our natural gas exports to the US by 30%.

Not because they don't us, because they're running out of it. So I wish both of you would kind of take that. I'm trying to create a little bit more sense of urgency, not panic. But we need to be more urgent in this building, because they're not taking this seriously.

It's kind of like well they just found a new well in the Gulf of Mexico. We'll be okay. So I'm going to ask questions about that too, but on terms of the sense of urgency on supply and its impact of 11%, if it came over a period of four or five years, that would be an incredible blow to us.

And I'm not sure it'll happen like that, but [inaudible] in on my thoughts because I can't get it across to people.

ROGER ANDERSON: I'd like to commend you about one part of all of that and that is that you really want to start locally and build out to that global view.

And this bill is concentrating on that. The question you want to ask is where do I get my energy now. How do I use it? How might I substitute things that I can produce here in Connecticut for oil I get from Saudi Arabia, for example?

Well what do you have? You have wind. You have solar. You have water. You have nuclear. You don't have any oil, unfortunately. Your bedrock is a billion years old.

SALLY ODLAND: You do have mega barrels of oil. You have any barrel of oil you can save is one you don't have to buy.

ROGER ANDERSON: You know mega barrels are getting back to this other discussion about the distributed generation. You really have to open your mind up to ways of solving your ultimate problem.

You don't care anything about oil. You only care about what it's used for. It's the similar with electricity. I don't care how electricity happens.

All I want to have is the switch to work when I flip it or when I turn on my hair dryer, although I don't use that much anymore. And that's where you begin and see where it takes you.

REP. BACKER: I can appreciate that, and I'm going to ask you and I think Senator Duff has rejoined us and I know he has some questions.

But I want to follow up a little bit on the point of this bill is really for the state, some official role of the state to start measuring what's going on around us so we can then take that seriously here.

I do hundreds of hours of research and come up with these hair brained ideas. But the rest of the folks here are interested in health care or education or any number of things that are important to our society.

And I keep saying without enough cheap. Well forget cheap. Without enough energy you're not doing any of that.

So can you make some suggestions as to relatively sparsely written bill as to what might be left out? Do you have any concept of what more we could do at this point, require? And if not, just say no.

SALLY ODLAND: Unfortunately, I told Representative Backer in the cafeteria that it was a fairly noxious bill and, so, he. As a start I think it's a very, very good place.

Things are going to have to go further, must faster, probably. But to start people talking, the first thing that

you need to do is these base line assessments, the sensitivities analysis.

I think this bill can't be the be all and end all of your analysis of security. This is the nose in the camel's tent. And it's very important to I think to start with this and I think that additional actions will suggest themselves once you're working with the separate agencies, once you're looking in the municipalities.

I think any number of concrete suggestions of new bills and actions are going to snowball out of it. I'd like to, you know, add that looking at the vulnerability of the power supply to feed stock problems to the bill, because you ask it to look at heating, cooling, transportation, vital services, food supplies, add power supplies, and I think you've got a slightly more robust bill.

ROGER ANDERSON: I would suggest that you don't ask for a written report on paper. That instead you ask for a computer program. That might cause you to panic for a second, but even an excel spreadsheet is a computer program.

So if you deliver these scenarios in excel, that means that everyone at this table in this room can play with the numbers and look at the equations that go into numbers.

And there's where you get innovation really starts happening. These kids this morning were, you know, ten years ago, five years ago they would have been on the climate.

And now they're onto energy and those two are so tightly linked that when you get the two of them together you really need to provide tools.

REP. BACKER: I know some other people have questions so I'll stop for now. But I did just want to point out that while the excel spreadsheet is probably fun for all of us, unless this scenario part can really talk to the disruptions in our society in a way.

If we hit a $150 a barrel, we don't heat our schools for under acts. We don't transport our kids. That's what Legislators understand. I mean, a series of chain of numbers is useful for some of us, but for most of us it's what happens to our state budget dollar and what happens to the lives well-beings of our citizens.

And those can't be put in numbers. Unfortunately, there's going to have to be some a lot of narrative with this. And I'm going to yield for somebody else's questions. Thank you.

REP. NARDELLO: Thank you, Representative Backer. Are there other questions from Members of the Committee? Senator Duff.

SEN. DUFF: Thank you, Madam Chair. Good afternoon. Thank you for being here and for your patience today. And I certainly want to thank Representative Backer for all his leadership on this issue.

To say the least that he's a nag on this issue, I mean that in a very kind way. It's not what I told you before, but you're not supposed to repeat that.

It's his charm actually, that leads us to this place right now. But I want to thank him for his leadership on this, because really he was the first person in this Legislature and probably the state to really take this on seriously, which brings you here today, again, from last year when we were hear for the initial meeting of the peak oil and natural gas Caucasus.

And the subsequent meeting we had which I'll probably never forget some of my colleagues saying thank you for scaring the blank-it-y blank out of me at that meeting.

But, hopefully, that did a good job of waking people up. And I know this is a process to get the state in the direction where we can show lead by example and also show others and our consumers how best they can affect their own future as well.

A couple of questions I had for you and I appreciate you really. You're coming here and your leadership in this issue. A couple of questions I had, you know, Connecticut is seen as a leader in energy efficiency and clean energy production and some of the things that we've done.

We always constantly get high ratings and high marks. What are some of the other low hanging fruit that's out there that you see that we can do to help from a statewide perspective, what we in Government can do to ourselves and how we can incent consumers to do some things that we haven't already done so far?

SALLY ODLAND: Since the bulk of oil is used for transportation, I think some of the easiest low hanging fruit is to find ways to enact policies both at state and municipal level that makes it easier for people not to have to travel around in their cars.

So any changes to code or Legislation that makes it easier for people to telecommute from home. Not only for a long-term lifestyle of choice, but in case there's a supply disruption and they actually can't get to work.

Obviously, any long-term movements toward electrification of transport and torch mass transport I think will save you lots of money and anything to reduce congestion where people are getting zero miles or five miles a gallon just sitting there.

Any Legislation that you can take that will ease the commuter burden I think will buy you a lot of oil.

ROGER ANDERSON: California has a couple of good examples for conversion to hybrid and electric vehicles. One that is spectacular is that they put a surcharge on the insurance that SUV's pay and they take 1/3 of that money and hand it to someone to pay their insurance on their energy efficient vehicle.

The other is the SUV lanes are not SUV lanes anymore. They're PEV lanes or hybrid plug-in vehicle lanes. That promotes the idea that you get a benefit from doing something good. And those things catch on really quickly and tend to spread.

SALLY ODLAND: Also, anything we can do to take our houses off life-support would be good. And this isn't speaking so much to the liquid fuels issue as to your constituent's pocket books and to your own Government's budgets, that we waste so much energy through inefficient buildings and a lot of our heat, especially, here it Northeast, is coming from oil.

Anything that we can do to replace that oil with renewable, any incentives, rebates, grants, anything you can do to help your constituents get solar pre-heat sun [inaudible] on their roofs or put in new windows, cut down on the heat loss.

So any place we can look for cutting loss I think is good. We probably have 25% to 35% in efficiencies that we can

grab quite easily [Gap in testimony. Changing from Tape 2B to Tape 3A.]

SEN. DUFF: --though we seem like we've done so much, there still is a lot of low hanging fruit out there. There's still a lot of waste.

And actually, I, since I'm saying this, it probably won't happen again, but for many months, except for probably December and January, our electric bill at our house has been under $100, and people say, how could that possibly be?

And it's through a lot of different things that we try to do to save energy, so I know that there's a lot of other people who could be doing the same thing if they were to understand what some of the incentives could be or some of the different ways to save energy that are out there.

I'm glad you brought in, start talking about people's homes. Are there any states that are either using incentives or writing laws about the kind of lead standards, or some type of standard for new construction of single-family homes or condos or multi-families or apartment buildings?

ROGER ANDERSON: California is really leading the way. The California Energy Institute is a really good website to start.

They are more desperate than we are in the northeast. They're still having low-end blackouts and low end brownouts and they're having a tough time out there, and you always look to the places that are having the hardest time for the places that are innovating the most.

SEN. DUFF: Sally.

SALLY ODLAND: I was just going to say, I don't personally know, but I do know who to ask. We have several national energy experts within [inaudible]. Randy Udolf is the one who leaps to mind. He's been doing a lot of innovative work in the [inaudible] Valley outside of Aspen, and I can get back to you with some state level resources.

SEN. DUFF: How about the European Union, or any other countries? Have they--

ROGER ANDERSON: Good point. They really are magnificently

well ahead of us. We are, the electricity guys are still here. They're creating a DC backbone, a direct current backbone for the whole European Union that will probably lower their electric bills by something like a third, actually conceptual.

Everybody dreams of having lower electricity bills, but we're really, the Europeans are looking for a world where you use twice as much electricity and pay half the price for it.

SEN. DUFF: How do they--

ROGER ANDERSON: How do they do that?

SEN. DUFF: How do they do that?

ROGER ANDERSON: They are very, very good at worrying about the system as a whole.

SEN. DUFF: The guy comes from Russia they have to be.

SALLY ODLAND: They have to be.

ROGER ANDERSON: They have to be. That's a very good point. They really have to be.

SALLY ODLAND: And they're using much smaller appliances much more, much more energy efficient appliances, much smaller cars.

ROGER ANDERSON: Another thing that came to mind was this concept of energy, Double Star we call it in New York. I don't know if it's an official name or not, but you know Energy Star has been one of the spectacular successes in getting appliances from computers to refrigerators to run on less power.

But Double Star is the concept of getting them smart, putting a computer in each one, so that they can negotiate with each other without any human intervention.

So if I'm in an apartment building that's got 20 refrigerators, the refrigerators talk to each other and decide when to turn themselves off, and they rotate around the building, each turning themselves off until their own personal thermostat sitting inside that personal, refrigerators aren't personal, but, their own individual thermostats tell them to turn on.

Just that kind of conservation can save you 20%, 30% of energy consumption just by doing things that are not stupid, like having all your refrigerators on at the same time.

SEN. DUFF: Yeah, that's smart. Our houses are dumb, right now, and I know they can get a lot smarter, and I think in the future they will be, actually.

Maybe you may have answered this question before, I can't remember and I apologize for being late.

What is your feeling right now with the technical floor for the price of oil, now that it's over $100? Do you know what it is today?

SALLY ODLAND: Yeah. OPEC meets Wednesday. We'll get a better feel then. Eighty to eighty-five dollars is the current consensus that I'm seeing. It kind of depends how fast we depreciate the dollar.

ROGER ANDERSON: And don't expect any sympathy from them.

SEN. DUFF: And actually, back in October, I think, we were estimating it was around $70, so it's gone up about $15.

SALLY ODLAND: We've depreciated the dollar a lot in that time.

SEN. DUFF: Right. So much that it's made that big change.

ROGER ANDERSON: The interesting point, $90 is the price you're paying for Saudi Arabian oil in the refiners in New Jersey right now today.

SEN. DUFF: How much?

ROGER ANDERSON: Ninety. Today. So that's $15, well, $15 under the market price, which--

SALLY ODLAND: But those are under long-term contracts.

ROGER ANDERSON: --means that those are under long-term contracts and those contracts are guaranteed to expire and therefore your price of your gasoline is guaranteed to go up. It's not an option. It's not, you know, you're talking about people saying in the summer, what's the price of gasoline going to be?

It's guaranteed to be higher than it is now, because now you're making your gasoline out of $90 oil, and the oil price is $1.04 today.

SEN. DUFF: Is some of our high gasoline prices a refinery issue, or is it a supply issue, or is it both?

ROGER ANDERSON: Well, both. Problem number one U.S. hasn't built a new refinery since 1970s, and so the refinery technology has indeed increased, but nobody's, and they are being built around the world, but nobody's building them in America.

What that means is that the gasoline is being refined in Saudi Arabia or in the Caribbean or in Venezuela and suddenly they're selling you the end product instead of the raw feedstock.

That makes you even more vulnerable to price, because now they have a gallon of gasoline and they can sell that anywhere that they can get the top, we used to say top dollar. But nowadays people are saying the top Euro.

SEN. DUFF: Okay, thank you. I think in our, and I appreciate your coming out here and testifying about the Bill. I think our issue here in the Legislature right now is, Representative Backer had started this process of starting to educate us about peak oil production and natural gas production, wrote the report, tried to educate our colleagues and also those in the Executive Branch.

We have to start somewhere. I know we don't have a lot of time, but we've got to move forward, but I think we do need the base lines, at least, of some information. So I appreciate his leadership, and thank you again for coming. Thank you, Madam Chairman.

REP. NARDELLO: Thank you. Are there any other questions from Members of the Committee? Representative Caron.

REP. CARON: Thank you, Madam. It occurs to me as we, as the discussion is going on as I think Representative Backer mentioned $150 barrel of oil.

Well, about a year ago I think we were in the sixties, so we've had over a 40% increase in the price of oil as of today, and yet the economy really, certainly has adjusted to it. It certainly has been strained, but it's adjusted, so it's not that oil is at $150 somewhere in the future, or

$100 today, it's the time element as well as to when it gets there.

And so, would you agree that perhaps and that's one of the ironies. The higher oil gets, or cost of energy gets, the more attractive the alternative, the alternatives of low-hanging fruit that you were just discussing becomes.

So do we really need that kind of shock of $150 barrel of oil within the next month, or perhaps rolling blackouts before people start getting the message?

So can you really plan for this?

SALLY ODLAND: Personally, I think it will take price chopping and gasoline station lines before people really start taking serious action themselves.

REP. CARON: But I remember in the '70s when we did have the shocks and I saw gas go up a penny a day as I was riding my motorcycle at McDonald's, at the age of 19, and then things changed. You conserved, and we got smarter and the price plummeted, and we started building big gas-guzzlers again, and we're right back where we were.

I mean the end of the oughts year, be playing like the '70s. I mean, are we really going to conserve our way out of this? Are we just getting lower prices?

SALLY ODLAND: Initially--

REP. CARON: There's a real awkward tension here between when you have a high cost of oil or energy, and then you get the conservation and the alternatives, but once you do that, the prices start to come down, you're not selling as much, and then you go back to the old ways.

SALLY ODLAND: This time it's different than the '70s, though. In the '70s, the new, the increased investment in oil exploration led to the North Sea and the North Slope both coming on. We had a lot more capital to throw at problems. Factor costs were low.

This time around, the oil companies have been investing record amounts on exploration and not getting the bang for the buck. They really haven't increased their discovery rate, despite the money they're throwing at it.

Much of that money is eaten up by price inflation, the cost

of labor, the day rates for ships, for rigs, all of that, and they're not finding the new supply.

So the chances of, the prices will fluctuate, yes, but the chances of returning to an era of cheap energy I think are slim to nil.

REP. CARON: Well, I would qualify that with a cheap petroleum.

SALLY ODLAND: Petroleum, excuse me.

ROGER ANDERSON: I really hold out hope, you know. At Columbia, we still do research on fusion, nuclear fusion. We're 50 years away now like we were 50 years ago, but some day we'll get there, and Rick Smalley, who is a leader in Texas.

Unfortunately, he died, but he always said, if we could solve the cheap energy problem, we can solve everything else. We can deliver food, we can deliver water, we can, you see, he had the whole list.

And our real hope here, the reason that Sally and I are here is that we don't have much hope for the feds, actually, I'm afraid.

When the Pentagon starts getting involved now, that becomes interesting, but the Department of Energy is rather hopeless in this issue.

But the states are taking the lead, and the State of Texas, the State of Florida, the State of Michigan, Minnesota, California, Connecticut, it's really the hope is that if you guys could get together with each other, without the feds being in the room.

I know it's probably pretty hard to keep them out, but--

REP. CARON: But until you get the shock to the system, you're just really not going to see much change until it's--

ROGER ANDERSON: Shocks to the system, an energy system are brutal, and I don't urge anybody to have to go through more than three days of a blackout, for instance.

The scenarios for delivering food to a city like Hartford three days after a blackout become pretty grim.

REP. CARON: But you see change.

ROGER ANDERSON: Yeah, but we don't want to get there. I'd rather put my vote in you guys.

REP. NARDELLO: Are there any further questions from Members of the Committee? Representative Backer.

REP. BACKER: I know people's stomachs are starting to growl, but as we move through this, I think what we see sometimes is, let's say we're aware, you know, 50 years from now we might be there or 25 years technology might be there, or 30 years it might be there, are all the things we have to offer today.

I think my concerns are when I look at different agencies around the world looking at peak production, whatever the cause of it is, declining dollar, whatever the cause is, because there's many, some of them say, even our own government, who is the biggest optimist on the planet say we probably hit peak oil in 20 years.

There are other governments who say seven or eight years. Some people say we've already passed it, so I think we're in the mix of it right now and every time, and I'm one of the sort of expert on the Gulf of Mexico, every time someone finds a new [inaudible] whether it's Jack, or whether it's down there, 15 billion barrels of oil, so why you, because I know we want to, why don't you just talk about current world demand, supply.

Because supply should, I mean demand should technically be dropping right now, but the price is still up there, because other people will cut demand, and how soon, I don't want you to put a day on it, but there's a gap here between what we have now and what we may have.

And we have to live with the gap now. If five years from now we can't heat a school in January for under, you know, $50,000 a week, we have a problem.

If we can't supply to the hospitals and healthcare, very energy dependent. If you can weed, you know, weed my question out of there? Current supply. How many barrels are we using? How many are we producing? What's the gap look like?

I know Pickens said we're at 86 or 88 and that's it. We're there. Other people say, well, we might, we'll never get

100 million.

So I think maybe for the Committees to talk about national usage, global uses, so we get a picture of this.

SALLY ODLAND: Okay. The current global oil consumption or demand is about 86 billion barrels a day.

Now, the supply has always pretty much matched the demand. They go in lock step. The difference is withdrawals from your stocks, like your industry stocks and your strategic petroleum reserves.

The current supply is about 74 million barrels a day. Now I know that sounds like a gap. That's conventional crude oil. That's crude oil. That's the more or less easy stuff.

The remaining part, the remaining 12 million barrels a day of that comes from natural gas liquids, associated condensed gas refinery gains, and also from synthetic fuels like the tarsan's oil, gets counted as regular oil, but essentially we're mining tar and with a highly energy intensive process we're creating a synthetic fuel out of it.

So a lot of people believe that the conventional oil has already peaked. The new incremental barrel is a much more expensive barrel and those are not only more costly, but much harder to increase the rate that we bring those on.

I want Roger to talk about the Gulf and the big finds like Jack or like [inaudible] Brazil.

ROGER ANDERSON: Well, you always want to be suspicious of those big finds but until after they're pumping oil. It's not so much that I'm down on the possibility that there's plenty of oil out there.

The real question is, how do you deliver it? Can you get it out of the ground fast enough and to a refinery fast enough, and to a car fast enough to consume it at the rates that you're consuming it at 100 million?

That's a ceiling in supply chain. It's a supply chain ceiling and it may not be a geological ceiling, but it is real and the scary part about the real part is it's probably going to hit, not in five years, but probably 2020 to 2030.

The reason I say that is because energy notoriously takes a long time to ramp up. We have abundant land. Texas just had a rolling blackout three days ago because the wind stopped blowing, and they have 4,000 megawatts of wind already in the State of Texas, and it took them 20 years of foresight to realize that West Texas has a lot of wind.

So what we're going to see here is an establishment of a pattern that says oil is expensive and tied and [inaudible] politically risky.

So say we do that today. It will take 20 years to ramp up into these alternative supplies that produce electricity, enough electricity to drive our cars.

We'll convert. But by that time we'll have a hard time delivering the electricity, so you've got a never-ending game of increasing consumption, which has to at some point revert to a game of doing things more and more efficiently.

And by then our cars, right now the [inaudible] car gets 140 miles to gallon equivalent, and it's a racing car. But that's the kind of car that everyone will drive in my opinion, 20 years from now.

Where's all the electricity going to come from for that, and we're going to scream into work, we're going to plug it into our parking lot, and we're going to suck all of the electricity demand for the state down and then the lights will dim, so it will be an interesting 20 years or so, and I think that's what the kids are picking up on when they do these projects. They really are worried about their futures.

SALLY ODLAND: Yes. And I think a critical question is, are we just going to try to re-tool everything so that we continue delivering fuel to cars and feeding them, or are we going to re-purposing how we use energy so we still deal with sustainable mobility but we're not necessarily feeding a car system. Are we using our oil and our energy for people?

And I just wanted to throw in a wonderful quote I heard yesterday from the Chief Economist at the International Energy Agency, the IEA, Fati Barule said, we're not yet at the end of oil supply, but we are reaching the end of the time to begin to plan for it.

REP. BACKER: Well, I want to thank you both for coming and

I think you know, technology may come along and maybe some of the fields will come on in 10 or 20 years, because I know how long they are to develop.

But the State of Connecticut will face a horrendous gap in providing services to the public. Its economy will contract if we don't get off the dime and get going very quickly.

So thank you so much for coming, and I think it's time for me to eat.

ROGER ANDERSON: Good luck to you.

SALLY ODLAND: Good luck.

ROGER ANDERSON: Keep up your energy.

REP. NARDELLO: Thank you. Are there any other further questions? If not, our next speaker is Commissioner Anne George.

COMM. ANNE GEORGE: Good afternoon. Thank you for the opportunity. Just briefly on this Bill, the Department is very supportive of this. The further analysis we can do and the planning and scenario analysis I think will be helpful in terms of the state's planning goals.

Specifically, on the natural gas issue, the Department has become increasingly concerned as this Committee has, with the state's over-reliance on natural gas for electric generation.

I recently saw a study by the Electric Power Research Institute that discussed the inter-dependency between natural gas and electricity, and the concerns about prices in the very near future, and so there are a lot of concerns that are building out there, and I think this is a great opportunity to get a handle on some of those concerns and make adjustments to our planning as necessary.

So with that, I'll be happy to answer any questions.

REP. FONTANA: Representative Backer.

REP. BACKER: Thank you, Mr. Chairman. Thanks, Anne. You know, natural gas is a real sensitive thing for us here, and I think that you guys are probably aware that Canada is having a hard time producing the amount of gas they used to and the Energy Board Canada has pretty much said, you know,